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Proceedings of the Regional Advisory Process on the Pre-COSEWIC assessment of Fraser River Sockeye Salmon (*Oncorhynchus nerka*)

March 1, 2012
Nanaimo, British Columbia

Meeting Chairperson:
Sean MacConnachie

Compte rendu du processus de consultation régionale concernant l'évaluation préalable à celle du COSEPAC du saumon rouge du fleuve Fraser (*Oncorhynchus Nerka*)

Mars 1, 2012
Nanaimo, Colombie-Britannique

Président de réunion
Sean MacConnachie

Fisheries and Oceans Canada / Pêches et Océans Canada
Science Branch / Secteur des Science
3190 Hammond Bay Road
Nanaimo, BC V9T 6N7

November 2012 | **Novembre 2012**

Canada

Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings include research recommendations, uncertainties, and the rationale for decisions made by the meeting. Proceedings also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

Avant-propos

Le présent compte rendu a pour but de documenter les principales activités et discussions qui ont eu lieu au cours de la réunion. Il contient des recommandations sur les recherches à effectuer, traite des incertitudes et expose les motifs ayant mené à la prise de décisions pendant la réunion. En outre, il fait état de données, d'analyses ou d'interprétations passées en revue et rejetées pour des raisons scientifiques, en donnant la raison du rejet. Bien que les interprétations et les opinions contenues dans le présent rapport puissent être inexactes ou propres à induire en erreur, elles sont quand même reproduites aussi fidèlement que possible afin de refléter les échanges tenus au cours de la réunion. Ainsi, aucune partie de ce rapport ne doit être considérée en tant que reflet des conclusions de la réunion, à moins d'indication précise en ce sens. De plus, un examen ultérieur de la question pourrait entraîner des changements aux conclusions, notamment si l'information supplémentaire pertinente, non disponible au moment de la réunion, est fournie par la suite. Finalement, dans les rares cas où des opinions divergentes sont exprimées officiellement, celles-ci sont également consignées dans les annexes du compte rendu.

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SUMMARY

A Regional Advisory Process (RAP) meeting was held on March 1, 2012 at the Pacific Biological Station in Nanaimo, B.C. to discuss a working paper focusing on the assessment of Fraser River Sockeye salmon (*Oncorhynchus nerka*) spatial distribution following COSEWIC and IUCN guidelines. The meeting was conducted to review information that will be provided to COSEWIC to support their assessment of the status of Fraser River Sockeye salmon in Canadian waters. Participation in this meeting included staff from Fisheries and Oceans Canada (DFO) Science, Fisheries and Aquatic management, Species at Risk program and external participants from the Provincial government, First Nations organizations, recreational fishing sectors, and environmental non-governmental organizations.

This proceedings report summarizes the relevant discussions and presents key conclusions reached at the peer review meeting. The supporting Research Document will be made publicly available on the CSAS Science Advisory Schedule at http://www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm

SOMMAIRE

Une réunion pour le Processus de consultation régionale (PCR) a eu lieu le 1er mars 2012 à la Station biologique du Pacifique de Nanaimo (C.-B.) pour discuter d'un document de travail portant sur l'évaluation de l'aire de répartition du saumon rouge du fleuve Fraser (*Oncorhynchus Nerka*) selon les lignes directrices du COSEPAC et de l'Union internationale pour la conservation de la nature. L'objet de la réunion était d'examiner les renseignements qui seront mis à la disposition du COSEPAC pour faciliter l'évaluation de l'état du saumon rouge du fleuve Fraser dans les eaux canadiennes. Au nombre des participants de cette réunion, mentionnons des employés des Sciences et de la gestion des pêches et des espèces aquatiques de Pêches et Océans Canada et des représentants du Programme des espèces en périls, ainsi que des participants externes provenant du gouvernement provincial, d'organismes autochtones, de secteurs de la pêche récréative et d'organisations non gouvernementales de l'environnement.

Le présent compte rendu résume les discussions pertinentes et présente les conclusions importantes tirées de la réunion. Le document de recherche à l'appui sera rendu public dans l'annexe de consultation scientifique du Secrétariat canadien de consultation scientifique à l'adresse suivante : http://www.dfo-mpo.gc.ca/csas-sccs/index-fra.htm

INTRODUCTION

A Fisheries and Oceans Canada (DFO) Canadian Science Advisory Secretariat (CSAS), Regional Advisory Process (RAP) meeting was held on March 1, 2012 at the Pacific Biological Station in Nanaimo to undertake a pre-COSEWIC review. Pre-COSEWIC reviews normally try to provide information on the following categories: 1) Life history characteristics; 2) Review of designatable units; 3) Review the COSEWIC criteria; 4) Describe the characteristics or elements of the species habitat to the extent possible, and threats to that habitat; 5) Describe, to the extent possible, whether the species has a residence as defined by the Species at Risk Act (SARA), 6) Threats; and, 7) Other. There is extensive information published respecting items 1, 2, 4, and part of 3 (the COSEWIC criterion related to population trends and size). The intent of this review is to focus on item 5 and the remaining part of 3 (population distribution), as this information has not been peer reviewed or made publicly available to date.

The Terms of Reference (TOR) for the science review (Appendix A) were developed in response to a request for advice from the DFO Species at Risk program. Notifications of the science review and conditions for participation were sent to representatives with relevant expertise from First Nations, the province of British Columbia and academia.

The CSAP participants reviewed the following working paper:

> "Assessment of Fraser River Sockeye salmon (*Oncorhynchus nerka*) spawning distribution following COSEWIC and IUCN Redlist guidelines" (CSAP WP2012-P52) by Louise de Mestral Bezanson, Mike Bradford, Simon Casley, Keri Benner, Tim Pankratz and Marc Porter.

The meeting Chair, Sean MacConnachie, welcomed participants, provided a general overview of the CSAS process and objectives of the meeting, discussed the role of participants, reviewed the agenda and the terms of reference. Every participant was considered as a reviewer of the document and was invited to participate fully in the discussion and to contribute knowledge to the review process, with the goal of delivering scientifically defensible conclusions and advice. In total, 29 people participated in the RAP (Appendix B). It was confirmed with participants that all had received copies of the Terms of Reference and working paper. Lily Stanton was identified as the Rapporteur for the meeting.

The Chair reviewed the Agenda (Appendix C) and the Terms of Reference for the meeting, highlighting the objectives and identifying the Rapporteur for the review. The Chair then reviewed the ground rules and process for exchange, reminding participants that the meeting was a science review and not a consultation. The room was equipped with microphones to allow remote participation by web-based attendees, and in-person attendees were reminded to address comments and questions so they could be heard by those online.

Members were reminded that everyone at the meeting had equal standing as participants and that they were expected to contribute to the review process if they had information or questions relevant to the paper being discussed.

The completed research document will be made publicly available on the CSAS Science Advisory Schedule at http://www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm

REVIEW

Working Paper:	Assessment of Fraser River Sockeye salmon (*Oncorhynchus nerka*) spawning distribution following COSEWIC and IUCN guidelines.
Rappoteur:	Lily Stanton
Presenter(s):	Mike Bradford and Louise de Mestral Bezanson

PRESENTATION OF WORKING PAPER

The main objective of the working paper was to provide information on the population distribution of Fraser River Sockeye salmon (*Oncorhynchus nerka)* in Canadian waters relevant to COSEWIC criteria and assess whether this species utilizes a "residence" as defined by SARA. Specifically, the spatial spawning distribution and analysis of the distributional metrics for 24 conservation units (CU) of Fraser River Sockeye salmon were completed in support of a request for a status report by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Authors provided a brief background of and description on the variety of methods used by the International Union for Conservation of Nature and COSEWIC to determine the extent of occurrence (EO), the area of occupancy (AO) and the number of locations for each CU and provided details on how the analysis were conducted as well as an evaluation and discussion of the results.

Points of clarification pertaining to the presentation of the working paper included:

Concerns that the title of Table 7 "Number of locations (streams or lakes) in each CU where spawning has been observed for three time periods" may be misleading or may be misinterpreted it is not assessing distributional data but rather how data was aggregated. This table actually depicts the number of locations where stock assessments occurred in which spawning was observed and may require some clarification. Additionally, the information provided within table 7 does not accurately reflect or incorporate all data from the 2011 stock assessment and should be corrected." The authors agreed to clarify and rectify these issues.

Further clarification was requested on the use and definition of the term area of occupancy. COSEWIC uses the term "index of area of occupancy" however "area of occupancy" is used throughout the working paper. It was confirmed by the authors that these two terms describe and mean the same thing and that the index of area of occupancy was abbreviated to area of occupancy for the purposes of this report.

It was brought to the authors attention that the CUs identified by Fisheries and Oceans Canada (DFO) and used within the working paper have recently been updated by DFO.

A participant asked whether the report linked specific spawning locations or the location of redds to potential threats or harm to that location. The authors specified that they considered larger threats such as forest fires, chemical spills, etc., that would affect a whole watershed, but acknowledged that many threats do occur at that spatial level and that these threats may be better encapsulated when examining COSEWIC criterion A rather than B, as this document was instructed to do.

Clarification was asked about COSEWIC criterion (e.g. B1, B2 and C) and how many of them need to be met in order to classify a species as endangered. For example, it was mentioned that most of the stocks, or CUs, are below the critical B1 and B2 values, but are other criterion used to designate a species as threatened or endangered? It was

verified that COSEWIC examines multiple criteria when assessing the status of a species and essentially the species must meet at least one of the identified criteria.

A request was made for authors to elaborate on the difference between extent of occurrence a (EOa) and extent of occurrence b (EOb). The authors explained that EOa and EOb were included in the report as alternate measures of EO that differed in method from that prescribed by COSEWIC to assess EO. EOa includes the entire watershed and land that drains to the areas that contains spawners and the EOb includes the catchment of occupied stream segments. Therefore EOb is much a smaller area than EOa. The authors did not recommend that the alternate EO methods be used by COSEWIC.

GENERAL DISCUSSION

EXTENT OF OCCURRENCE AND AREA OF OCCUPANCY

Concerns were expressed regarding the calculation of the extent of occurrence (EO), the area of occupancy (AO), and the problems surrounding both the definition of these two terms and how they were used and interpreted within the report. IUCN and COSEWIC recommend that only one life stage be used in the assessment of a migratory species and that either the breeding or non-breeding area be used when calculating the EO or AO. In some cases, such as with migratory species, COSEWIC states that the smallest area essential to the survival of the existing population at any one life stage may be used. Participants disagreed with the use and interpretation of spawning locations to calculate the distribution (EO and AO) as the bulk of the population is not in the spawning ground at any one time and that most of the population will be in the lakes and oceans. An assumption made by the authors is that spawning habitat is the most limiting habitat for characterizing the relative risk to spatially-based threats. It was suggested that upstream migration holding areas may instead be considered the most limiting habitat to characterize risk to spatially-based threats, as they hold the highest density and highest aggregation of Fraser River Sockeye salmon in the smallest area. In summary, there was considerable debate on what spatial area is most appropriate for assessing these COSEWIC distribution metrics for anadromous salmonids, which have a unique age structure, life-history and, therefore, spatial distribution.

Although all participants agreed that the analyses contained in the report were acceptable and defensible, it was brought to everyone's attention that debates surrounding the use of EO and AO and what spatial area best represents EO and AO for migratory salmonids with multiple age classes, and debates concerning the extirpation risk that the resultant EO and AO represent, are concerns that may need to be dealt within the COSEWIC process, and other similar processes. However, many argued that the concerns and problems associated with the use of these criteria and distribution metrics by COSEWIC should be mentioned and commented upon within the report. Suggestions were also made that authors should discuss how the distribution information is interpreted, and that the authors need to be more explicit in explaining why spawning locations were chosen for the calculation of EO and AO. The authors agreed to highlight alternative methods and the assumptions made when choosing spawning locations to determine the distribution or the EO and AO of Fraser River Sockeye salmon.

VAGRANTS

The importance of vagrants and how vagrants were identified or defined within the report was questioned. Lacking a definition of vagrants from COSEWIC, the authors defined vagrants as those individuals occupying spawning sites with <100 estimated spawners in all four years of observations. Although the report found no significant differences in the analysis with the inclusion or omission of vagrants, many felt the importance of vagrants as spawners at particular sites should not be down played and may still represent persistent spawning locations. The authors agreed and explained that COSEWIC does not define vagrants and so had to develop their own working definition. One participant suggested that the definition of vagrants needs to be qualified using or specific criterion such as unique genetic structure rather than just using numeric terms and stressed that there may be a low bias in these estimates. It was advised that authors should clearly state, for purposes of this report a numerical value of 100 was arbitrarily chosen by the authors to identify potential vagrants.

SENSITIVITY OF METRICS

Some time was spent discussing the sensitivity and use of the methods/metrics in the analysis and ultimately the implications and the value of information that is being provided on the status of Fraser River Sockeye. The results of the working paper indicate that 23 out 24 conservation units are risk of extirpation based on the EO criterion and many argued whether this information is meaningful and informative. Questions were raised on how these results should be interpreted. Participants believed that these results, predicting that most populations are at risk, are not useful or instructive, since the method used is clearly not sensitive enough to provide resolution amongst CUs in regards to their actual level of risk. Additionally, in the current assessment, authors assumed that the CU structure would likely be the smallest level to which the entire distribution of Fraser River sockeye would conceivably be split in the upcoming COSEWIC assessment. Due to the nature of the EO and AO analyses, it would be easier to group analysed CUs into larger amalgamations than to split them into smaller ones. Thus, use of the CUs provided the most flexibility to COSEWIC should it decide to assess the population at a different level of differentiation. As an alternative approach, one participant recommended that the authors could calculate the extent of occurrence for the entire Fraser River Basin or include the entire ocean to address critical life stages. However, a concern was raised that aggregating all populations may in turn underestimate risk and that designatable units such as CU's have been well developed and reviewed and must contain information about a species' genetic structure, productivity and/or life history. Suggestions were made to highlight all of these concerns within the document and discuss additional considerations and alternative methodologies. Furthermore, the general consensus was that more sensitive distributional metric methodologies need to be developed in the future that will be more informative and applicable for salmon populations and can measure risk more accurately.

This led to discussions on the larger issues dealing with COSEWIC and IUCN distribution criteria (and benchmarks) and the applicability these metrics to aquatic species, specifically fish. The problems associated with how populations are defined (for Pacific Salmon it is at the discrete CU level) or identified as at risk by COSEWIC were discussed at length. It was noted that the purpose of this working paper was to provide an analysis of distributional metrics to provide to COSEWIC for their assessments of their criterion B (Small Distribution Range and Decline or Fluctuation), and criterion D

(Very Small or Restricted Total Population). However, provision of these distribution metric results for Fraser Sockeye CU, does not presume how COSEWIC will interpret these results in the context of a multi-criteria COSEWIC status evaluation. Authors were asked to provide more clarification and mention within the report that other criterion (not just distribution metrics) will be used by COSEWIC in the final status assessments. Participants flagged the fact that the no strong rationale was provided by authors regarding recommendations for using or not using the COSEWIC distribution metrics and criteria in status evaluations. It was suggested that the authors should clarify that recommendations made in the report are restricted to the methodology that should be employed and not to what and how calculated metrics should be used in a COSEWIC assessment.

THREATS TO SPECIES AND ASSESSMENT OF RISK

Attention was drawn to the fact that threats to a species occur in both time and space and at different life stages and that a temporal component is not considered in the COSEWIC distribution metrics assessed in the current report. Spatially, the distributional patterns are similar to what may have been seen in the 1940s with just a lower number of fish and because this report is only looking at spawning distribution within the last four years we do not get a good understanding of longer term temporal trends in abundance and distribution. It was also pointed out that we are dealing with a wider range of abundance and contrast between or among years and that the methods used in this report did not capture this. For example, many participants expressed concern that the metrics did not distinguish or were not able to differentiate between high and low abundance years, such as the historic returns seen in 2010. The authors recognized that the four years of data (2008-2011) contained in this report include the 2010 year with high abundance but also reminded the participants that the methods estimated extent of spawning habitat and questioned whether adjustments to the methods would make a significant difference to the overall results. The general consensus of participants was that the authors should comment on the limitations of the methods to detect and differentiate between high and low abundance years, with particular reference to the 2010 anomalously high return event.

RESIDENCE AND LOCATIONS

One participant was concerned that the report defines residence only in the context of spawning areas and questioned how this narrow definition of residence would address threats to other areas or life stages and consequently how SARA would use this information to deal with protection of the species. It was noted that SARA has only just identified its first residence for a species and that the guidance on residence is evolving. One participant felt that the methodology used by COSEWIC in applying residence requirements is insensitive to ranking risks across CUs in a defensible way. In addition there was a concern expressed regarding the number of locations reported within the document. Data and surveys were completed for escapement purposes. Surveys have not been consistent in how area was surveyed from year to year and this may have an effect on how we interpret and determine the number of locations. The authors concurred and agreed to clarify limitations to location definition in the report. Attention was drawn to the fact that COSEWIC does not provide a clear definition of locations for salmon populations.

CONCLUSIONS

- Authors were able to successfully estimate both the extent of occurrence and the area of occupancy, and the number of spawning locations, for all Fraser River Sockeye salmon CUs based on spawner distribution data collected from 2008-2011. No decline or extreme fluctuation in number of locations was observed from 1992 to 2011. Evaluations of a variety of techniques and alternate measures of extent of occurrence and area of occupancy demonstrate little change relative to most COSEWIC thresholds. The exclusion of sites containing potential vagrants had no overall effect on classification levels suggesting that data including sites where few spawners were observed could be used.
- The paper was accepted subject to revisions.
- There was agreement that the working paper meets the obligations to COSEWIC for their distribution criteria, through the provision of Fraser Sockeye CU estimates of both the extent of occurrence and the area of occupancy based on spawner data collected from 2008-2011, and the number of spawning locations, based on spawner distribution data collected from 1992-2011. .
- The review participants concluded that at this time the authors' current methods used to calculate the extent of occurrence and the area of occupancy is the most appropriate method given the data available.
- Participants stressed, however, that applying these distribution metric results to status assessments (i.e. comparing these results to COSEWIC or IUCN benchmarks) may require careful interpretation since these criteria (and their associated benchmarks) were not specifically developed for the unique life-history's of Pacific Salmon conservation units, which include multi-year age structures and anadromy (Pacific Salmon CUs occupy the North Pacific, and freshwater ecosystems systems simultaneously in any given year).

RECOMMENDATIONS

A range of recommendations were provided to improve the working paper and to provide clarification and identify uncertainties and limitations of the methods used to estimate population distribution relative to COSEWIC criteria. The advice put forth includes:

- Highlight alternative methods and the assumptions made in choosing spawning locations to determine the distribution of Fraser River Sockeye salmon and provide an explanation as to why spawning locations were chosen for the calculation of the extent of occurrence and the area of occupancy.
- Incorporate discussions on vagrants and explain how the number of <100 vagrants was arbitrarily chosen by the authors.
- Further exploration into calculating extent of occurrence and area of occupancy of Fraser River Sockeye salmon incorporating the entire Fraser River Basin.
- Address and provide a discussion on the sensitivity of the methods used and discuss additional considerations and alternative methodologies.
- Future research should focus on developing more sensitive and more appropriate distribution metric methodologies to measure risk more accurately for salmon populations (since COSEWIC/IUCN metrics were not specifically designed for the unique age structure and anadromous life-history of Pacific Salmonids)

- The participants suggested that the authors should clearly state that the recommendations provided within the working paper and the use of the distribution metrics follow COSEWIC guidelines for their status evaluations. The recommendations stated in the report should not presume how COSEWIC will interpret these results in their status evaluations, in light of the unique age structure and anadromous life-history of Pacific Salmonids.
- Authors should address and discuss the limitations of the methods to capture the temporal assessment of risk and the inability of the methods to detect differences between high and low abundance years.

ACKNOWLEDGEMENTS

The chair wishes to acknowledge and thank the authors for their hard work, and the active engagement of the participants to improve the quality of the scientific advice. Also, thanks to Nic Dedeluk of the CSAS office for coordinating and arranging meeting logistics and managing the webinar. Thank you to Mrs. Lily Stanton for being the Rapporteur.

APPENDIX A: TERMS OF REFERENCE

TERMS OF REFERENCE
Fraser River Sockeye Pre-COSEWIC
Regional Peer Review Meeting – Pacific Region
March 1, 2012
Nanaimo, BC
Chair: Sean MacConnachie

Context

The implementation of the federal *Species at Risk Act* (SARA), proclaimed in June 2003, begins with an assessment of a species' risk of extinction by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). COSEWIC is a non-government scientific advisory body that has been established under Section 14 of SARA to perform species assessments which provide the scientific foundation for listing species under SARA. Therefore, an assessment initiates the regulatory process whereby the competent Minister must decide whether or not to accept COSEWIC's assessment and add a species to Schedule 1 of SARA, which would result in legal protection for the species under the Act. If the species is already on Schedule 1 of SARA, the Minister may decide to keep the species on the list, reclassify it as per the COSEWIC assessment, or to remove it from the list (Section 27 of SARA).

Fraser River Sockeye is currently being assessed by COSEWIC. Fisheries and Oceans Canada (DFO), as a generator and archivist of information on marine species, is to provide COSEWIC with the best information available to ensure that an accurate assessment of the status of a species can be undertaken. Pre-COSEWIC reviews normally try to provide information for the categories: 1) Life history characteristics; 2) Review of designatable units; 3) Review the COSEWIC criteria (COSEWIC, 2010); 4) Describe the characteristics or elements of the species habitat to the extent possible, and threats to that habitat; 5) Describe, to the extent possible, whether the species has a residence as defined by SARA, 6) Threats; and, 7) Other. Currently there is extensive information published respecting items 1, 2, 4, and part of 3 (the COSEWIC criterion related to population trends and size). The intent of this review is to focus on item 5 and the remaining part of 3 (population distribution), as this information has not been peer reviewed or made publicly available to date.

Results of this Regional Advisory Process (RAP) will be made available to COSEWIC, the author(s) of the species status report, and the co-chairs of the applicable COSEWIC Species Specialist Subcommittee.

Meeting Objectives

The overall objective is to review available DFO information relevant to the COSEWIC criterion related to population distribution of Fraser River Sockeye in Canadian waters and assess whether this species utilizes a "residence" as defined by SARA.

One working paper will be developed to consider the following:

1) Spawning Population Distribution (COSEWIC Quantitative Criteria and Guidelines for the Status Assessment of Wildlife Species, Criterion B – Small Distribution and Decline or

Fluctuation): Using information the most recent survey information for the species in Canada as a whole and for each designatable unit summarize the following:

i. The current extent of occurrence (in km^2) in Canadian waters

ii. The current area of occupancy (in km^2) in Canadian waters

iii. Changes in extent of occurrence and area of occupancy over as long a time as possible, and in particular, over the past three generations.

iv. Any evidence that there have been changes in the degree of fragmentation of the overall population, or a reduction in the number of meta-population units.

2) Species Residence: To the extent possible, determine whether the species has a residence as defined by SARA. SARA's 2(1) defines Residence as "a dwelling-place, such as a den, nest or other similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing, staging, wintering, feeding or hibernating."

Expected Publications

- CSAS Science Advisory Report
- CSAS Proceedings
- CSAS Research Documents are expected from the working papers submitted for review.

Participation

Participants will be invited from: DFO (Science, Oceans, Habitat and Species at Risk), Aboriginal Communities, Province of BC, Academia, Industry, Non-governmental Organizations and Other Stakeholders.

References

COSEWIC. 2010. COSEWIC's Assessment Process and Criteria. http://www.cosewic.gc.ca/eng/sct0/assessment_process_e.cfm

APPENDIX B: ATTENDEES

Centre for Science Advice Pacific
Regional Advisory Process Participation Plan

Meeting Title: Fraser River Sockeye pre-COSEWIC RAP **Updated:** 01-Mar-12

Last Name	First Name	Affiliation	DFO / External	Attend
DFO Participants				
Bradford	Mike	Science SAFE	DFO	A
Candy	John	Science SAFE	DFO	A
Curtis	Janelle	Science MEAD	DFO	A
de Mestral Bezanson	Louise		DFO	A
Decker	Scott		DFO	A
Godbout	Lyse	Science MEAD	DFO	
Grant	Sue	SA Fraser-BCI	DFO	A
Hyatt	Kim	Science SAFE SA	DFO	A
Joyce	Marilyn	Science CSAP	DFO	A
Kenyon	Robyn	SASR-RHQ	DFO	A
MacConnachie	Sean	Science MEAD	DFO	A
Rusch	Bryan	South Coast	DFO	A
Saunders	Mark	Science SAFE	DFO	A
Sawada	Joel	Science SAFE SA	DFO	A
Stanton	Lily		DFO	A
Tompkins	Arlene	Science SAFE SA	DFO	A
Velez-Espino	Antonio	Science SAFE SA	DFO	A
Whitehouse	Timber	SA Fraser-BCI	DFO	A
Bailey	Richard	SA Fraser-BCI	DFO	W
Huang	Ann-Marie	FAM LFA	DFO	W
Tadey	Joe	SA Fraser-BCI	DFO	W
Van Will	Pieter	SA South Coast	DFO	W

External Participants				
Blackbourn	Dave	DFO Scientist Emeritis	E	A
Johnnie	Kathleen	Lyackson First Nation	E	A
Laliberte	Bernette	Cowichan Tribes	E	A
McDuffy	Misty	Raincoast Conservation	E	A
Pestal	Gottfried	Contractor	E	A
Taylor	Greg	Pacfic Salmon Foundation	E	A
Argue	Sandy	Province of BC	E	W
Hill	Aaron	Watershed Watch Salmon Society	E	W
Kristianson	Gerry	Sport Fishing Advisory Board	E	W
McCallum	Brent	SFAB representative on the PSC Fraser Panel	E	W

APPENDIX C: AGENDA

Regional Peer Review (RPR)

Centre for Science Advice Pacific

AGENDA

Pre-COSEWIC Assessment for Fraser River Sockeye

March 1, 2012

Seminar Room, Pacific Biological Station
3190 Hammond Bay Rd., Nanaimo, BC

Chairperson: Sean MacConnachie

de Mestral Bezanson,L., M.Bradford, S. Casley, K. Benner, T. Pankratz, M. Porter. 2012. Assessment of Fraser River Sockeye salmon (*Oncorhynchus nerka*) spawning distribution following COSEWIC and IUCN Redlist guidelines CSAP Working Paper 2012/P52

Thursday March 1st

9:00	Introductions	Sean MacConnachie
	Review Agenda & Housekeeping	Sean MacConnachie
	CSAS Overview & Procedures	Sean MacConnachie
	Review of Terms of Reference as pertains to research document	Sean MacConnachie & RAP Participants
9:20	Presentation of Working Paper	Authors
9:50	Questions of Clarification	RAP Participants
10:15	***Break***	
10:30	Presentation of Reviews & Authors' Responses	Reviewers & Author(s)
12:00	***Lunch Break***	
1:00	Discussion and Building Agreement on Conclusions, Recommendations, Advice and Future Work	RAP Participants
4:00	***Adjournment***	